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THE NEW ENGLAND BOTANICAL CLUB

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THE GEOGRAPHIC ORIGIN OF CRATAEGUS VIRIDIS L.

B. F. Bush.

The authors of the manuals and floras of the Northeastern States, and of works on the trees of North America, as well as the writers in general on Crataegus give as the range of *Crataegus viridis* L. some such expression as, "from Maryland and Virginia to Florida, west to Louisiana, Arkansas and Texas, and up the Mississippi Valley to Saint Louis, Missouri."

It would seem that this claim is ably supported by the presence of an association of over two hundred characteristically southern plants in southeastern Missouri, conspicuous amongst which are *Taxodium distichum, Acer Drummondii, A. Carolinianum, Aesculus austrina, Leitneria Floridana, Arundinaria tecta, Hicoria aquatica, Styrax Americana, Nyssa aquatica, Catalpa speciosa, Planera aquatica, Ilex opaca, Fraxinus profunda, Bradleya macrostachys, Populus heterophylla, Itea Virginica, Quercus lyrata, Q. Phellos, Q. Michauxii, Phoradendron flavescens, Brunnichia cirrhosa, Euonymus Americanus, Gleditsia aquatica, Crataegus Marshallii, Aralia spinosa, Berchemia scandens* and *Liquidambar Styraciflua,* species which have come up the old valley of an ancient sea. That they *have* come up is attested by individuals occurring all the way down this valley to the center of greatest distribution, but that the presence of these two hundred and odd southern species in southeastern Missouri proves that *Crataegus viridis* L., and its congeners, came up the Mississippi Valley, is hereafter to be greatly doubted.

Much has been written of plant distribution, and I am fully aware of the importance of such an association as that indicated in the preceding paragraph, and reasoning from our knowledge of the inland extension along the Mississippi Valley of so many characteristically southern species, it would on first thought appear that *Crataegus viridis L.* has merely followed in the wake of its southern companions, with which it is so often found in the Southern States.

That any species should ascend the former bed of this ancient inland sea for so great a distance as to Saint Louis, Missouri, without leaving along the path of its invasion a certain number of scattered individuals is scarcely believable; and I will proceed to show the futility of longer believing that *Crataegus viridis* L., and its many forms, came up the Mississippi Valley to Saint Louis, Missouri, and to demonstrate that any species is much more likely to skip large sections of country in going down such a valley.

Having observed and studied *Crataegus viridis* in northern Florida, southern Alabama, southern Mississippi, Louisiana, southern Arkansas and southeastern Texas during the past fifteen years, I have noted that the species inhabits regions of relatively low altitude, sometimes straying to comparatively high ground near by. I have visited many places in northern and northeastern Arkansas, and have collected at Hoxie, Jonesboro, Marked Tree and Paragould in that state, and as far as I have observed the tree, *Crataegus viridis* L. is rare there. In adjacent Missouri I have noted as many as fifteen of twenty trees of this species in Dunklin County, a half dozen or so in Butler County, and the species is quite unknown in Scott, Stoddard, Wayne, Ripley, Carter, Oregon, Shannon, Howell, Texas, Wright, Webster, Greene, Christian, Taney, Stone, Barry and McDonald Counties, a strip reaching from the Mississippi River to the western boundary of the State, where I have done much collecting.

Some eight or ten years ago I found at Webb City and at Joplin, Missouri, a great colony of *Crataegus viridis* or forms of that species, and as this locality is mostly over one thousand feet in altitude, it seemed to me that these forms could not be the true *Crataegus viridis* of Linnaeus, which is a coastal species and inhabits low altitudes. Several years investigations have shown that this great colony of *Virides*[1] extends west into Kansas, southwest into and across Oklahoma, and as far as Llano, Dallas, and Fort Worth, Texas.

That this great colony, which I shall herein designate as the Western

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[1] I here use the sectional name *Virides* for *Crataegus viridis* and the many forms which are closely related to it.

Ozark Colony, has anything to do with the great body of Southern *Virides,* which are, as stated above, coastal plants occurring at low altitudes, is highly improbable, as it nowhere joins this southern body of trees and the individuals composing it show a decided preference for high rocky barrens and plains.

In the first part of this paper I have alluded to the well-known fact of plant association and have named about twenty-five trees and shrubs of the two hundred and odd southern species that occur in southeastern Missouri and which are found with the true *Crataegus viridis* of Linnaeus in the Southern States, and I now call attention to the fact that not one of these characteristically southern plants is to be found associated with the Western Ozark Colony, but that the *Crataegus* is here associated with a very different set of plants, of which *Quercus Marylandica, Hicoria villosa, Cornus florida, Viburnum rufidulum, Diospyros Virginiana, Fraxinus Americana, Sassafras variifolium* and *Ulmus fulva* are the most representative, all plants noted for their preference for high, dry and rocky ground.

Some three years ago I visited Hannibal, Missouri, which is some hundred and twenty-five miles north of Saint Louis, the supposed northern limit of *Crataegus viridis* L., and was agreeably surprised to find on the high hills and mounds there several species or forms of *Virides,* quite a colony, and later I saw many acres of trees in the river bottom opposite Hannibal, in Illinois, near the town named Shepherd.

Having quite recently visited Quincy, Illinois, twenty miles north of Hannibal, Missouri, and one hundred and forty-five miles north of Saint Louis, I was further surprised at seeing the hills and mounds around that place covered with *Virides,* many thousands of individuals, some of the trees being the largest specimens I had ever seen. Many of these trees are on the high hills at Keokuk, Iowa, and the forms no doubt occur in all eastern Iowa, and perhaps as far north as southern Wisconsin. There are so many specimens at this colony, which I shall designate as the Upper Mississippi Colony, perhaps one hundred times as many as in all southeastern Missouri and northeastern Arkansas, that it is undoubtedly the center of greatest abundance, and the *Virides* found at Saint Louis, Missouri, instead of coming up the Mississippi Valley, have really straggled down it.

This Upper Mississippi Colony is so far from the great southern body of *Virides,* having not a single southern plant associated with it, that there can be scarcely any doubt that the species composing it are distinct from the southern species, and as over three hundred miles of forest land and prairie lie between it and the Western Ozark Colony, an area in which no *Virides* have ever been found, it is hardly probable that the species of the two colonies are the same.

To me it is apparent that in some remote time the Western Ozark Colony, as well as the Upper Mississippi Colony, consisted of a few individuals, which have adapted themselves to their surroundings and have continued to multiply until today there are thousands of individuals at each colony differing more or less from each other and from the original members of the colony.

Whether these forms are sufficiently distinct to be called species or varieties is a question which may never be settled, but I am firmly of the opinion that these colonies contain species more or less fixed, species with which I am somewhat familiar and which are as yet undescribed,[1] but which I do not wish here to describe, leaving that to those more capable of drawing their descriptions and determining their relationships.

Having shown that the center of greatest development for *Crataegus viridis* L. is not, as has been so often stated and generally believed, in the Lower Mississippi or Gulf region, but rather in the Upper Mississippi Valley, and that in all probability this species and its most nearly related congeners were distributed from that center, it may be worth while briefly to inquire, even though it may be possible to do little more than speculate, as to how this distribution was effected.

The true key to the distribution of *Crataegus viridis* L., as of many of our trees and some herbaceous plants, is probably to be sought and ultimately, if ever, found in the records of the flora of the later Tertiary period: a record, unfortunately, very imperfect and but little understood, and one which, at least so far as present day discoveries have gone, seems to have been almost totally effaced in the region under consideration.

It has been pointed out that in Tertiary times a great inland sea or arm of the gulf extended far up the present valley of the Mississippi into what is now southeastern Missouri, occupying all of Missouri lying southeast of a line drawn from Cape Girardeau through Whitewater, Greenbrier, Wappapello, Poplar Bluff and Acorn, coinciding very nearly with the line of the St. Louis, Memphis and Southeastern

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[1] Since this paper was written Sargent has described in the twenty-second Annual Report of the Mo. Bot. Garden, four species of this group.

Railway. Into this inland sea the ancient river was discharged approximately one hundred miles south of Saint Louis, and the colony of southern arborescent species now found in that region is undoubtedly a vestige of the semi-tropical forests that once bordered this ancient sea. Beyond this area, however, deposits of Tertiary age are but little developed in the Upper Mississippi Valley, and scarcely a trace of the fossilized flora has been preserved.

It is a fact perhaps not without significance in this connection, that in southwestern Missouri and southeastern Kansas, where, as has been stated, a form of *Crataegus viridis* is abundant, many of the high hills are covered with a deposit of gravel, consisting of waterworn fragments of chert, undoubtedly of local origin, but indicating the former existence of a great drainage system towards the southwest. These deposits, which are particularly abundant about Webb City and Joplin, Missouri, have been designated by geologists as Lafayette Gravel and assigned to a time late in the Tertiary period. Over the higher elevations of the region they may be traced for many miles, indicating the course and magnitude of an ancient river, as in places they attain a thickness of from ten to eighteen feet. This region lies entirely beyond the area of glaciation, which embraced all of northern Missouri and extended a little south of the Missouri River, and this fact doubtless accounts for the preservation of the Lafayette deposits here, while certainly they would have been obliterated to the northward by the ice mantle and the floods that marked its recession and inundated the country far beyond its southern limits.

The Mississippi River of that period, or its precursor, a small and unimportant stream discharging itself into the Tertiary sea, was doubtless bordered by forests of many species. It is reasonable to suppose that the *viridis* form of *Crataegus* would be borne down by the waters of this stream from its northern home and that individuals would establish themselves at intervals along its course and about the coasts of the ancient sea, following the ever extending limits of the land to the south, until at length a form appeared, the *Crataegus viridis* of Linnaeus, as we know it, which found a suitable habitat and attained a vast development in the low-lying coastal plains of the Gulf States.

On the other hand, following the great drainage system to the southwest, other individuals of the parent species would establish themselves along its course and there enter into competition with plants of a very different region. As the ancient river system gradually became obliterated owing to the elevation of the land to the south and west, the species composing the lowland forests would one by one become extinct and give place to highland or xerophytic species. Through the vicissitudes of this changing order a form of *Crataegus viridis* was in some manner able to maintain itself, as is testified by its abundance at the present time on the limestone hills of southwest Missouri and the region to the southwestward.

Our present knowledge regarding the origin of species is, of course, not sufficient to enable us to do more than conjecture as to how this came about. Possibly a fortuitous variety or type happened to be developed in this region that was better adapted to the new conditions and was thus able to withstand the increasing dryness, so that, while the species became for the most part extinct in the upper part of the ancient river course, this particular stock was entirely isolated from the parent colony and became the progenitor of the forms of *Crataegus viridis* now found occupying the regions of comparatively high altitude in the southwest, comprising the Western Ozark Colony.

If I have not added any new species to the genus *Crataegus* in this paper, I have at least shown that the *Virides* may have *not* come up the Mississippi Valley, as has generally been supposed, but have probably drifted *down* this Valley from the great Upper Mississippi Colony at Hannibal, Missouri and Quincy, Illinois.

Courtney, Missouri.

VIOLA RENIFOLIA AND V. BRAINERDII.

M. L. Fernald.

Botanists who have collected extensively in the Northern States and Canada are familiar with the fact that *Viola renifolia* often appears in two quite different forms: the true *V. renifolia* as described by Gray, with both sides of the leaves "conspicuously beset with pale, soft and tender, lax hairs";[1] and another extreme with the upper leaf-surfaces quite glabrous from the first or in anthesis with only a very few scattered and quickly deciduous hairs. This latter plant, with the upper leaf-surfaces glabrous or quickly glabrate, was separated by Greene in 1902 as *V. Brainerdii,* with the statement that it is "certainly a far more common plant in northern New England and Canada than the kindred species [*V. renifolia*]," [1] and that it has a more upland habitat. But, although the cautious and very accurate student for whom *Viola Brainerdii* was named has not recognized it as a species, he has recently expressed his understanding of the question as follows:

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[1] Gray, Proc. Am. Acad., viii. 288 (1870).

"The type of VIOLA RENIFOLIA Gray is markedly pubescent throughout; but the more common form has at least the upper leaf surface glabrous, and has been published as a species, *V. Brainerdii,* by Professor Greene. But the difference between the two plants, though perhaps worth naming, is not specific, according to my conception of species." [2]

This commoner extreme of *Viola renifolia,* with the leaves glabrous above, though connected with the pubescent extreme by some transitions, is apparently a positive geographic variety and as such it should be separated. That it is, as already stated by Greene and by Brainerd, the commoner plant of the two is shown by the fact that of the 97 specimens of the species in the Gray Herbarium and the herbarium of the New England Botanical Club only 22 are of the typical copiously pubescent *V. renifolia,* while 63 are very good *V. Brainerdii* and 12 represent both extremes under the same label. But, although in northern New England and New York the two are thus sometimes found together and by some collectors have been taken to be trivial variants of the same plant, it is significant that no typical *V. renifolia* seems to have been collected northeast of New England, while in the Maritime Provinces, eastern Quebec, western Newfoundland and southern Labrador the essentially glabrous *V. Brainerdii* with bright green leaves is a common plant. Its more northern tendency is also indicated by the fact that north of the Straits of Belle Isle it is abundant on dry exposed crests where it is associated with many arctic-alpine plants such as *Poa alpina* L., *Salix vestita* Pursh, *Cerastium alpinum* L., and *Saxifraga caespitosa* L.; and in the mountains of the Gaspé Peninsula it ascends to an altitude of 1100 meters, where it is found on dry limestone crests with the plants just enumerated or with *Carex rupestris* All., *Saxifraga nivalis* L., *Dryas integrifolia* Vahl, *Pedicularis flammea* L., *Campanula uniflora* L., and other arctic-alpine types. In the mountains of Colorado also this glabrous plant ascends to high altitudes, reaching 2500 m., and thence it extends northward to northern British Columbia. As a geographic variety it is well marked and it should be called VIOLA RENIFOLIA Gray, var. **Brainerdii** (Greene) n. comb.

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[1] Greene, Pittonia, v. 89 (1902).

[2] Brainerd, Bull. Torr. Bot. Cl. xxxviii. 8 (1911).

GRAY HERBARIUM.

SOME LICHENS FROM NANTUCKET ISLAND, MASSACHUSETTS.

R. HEBER HOWE, JR.

MR. EUGENE P. BICKNELL on a collecting trip to the islands of Nantucket and Tuckernuck, Massachusetts, last June (1911), was kind enough at my request to gather for me a considerable number of lichens. Though Mr. Bicknell had never collected lichens before, the collection he made contains beside the more common species a number of lichens decidedly worth recording.

It is not improbable that some lichenist in the past has collected at Nantucket, but beside a few specimens in my own herbarium collected by non-botanical friends, and a plant or two found in the Alexander W. Wheelock herbarium, I have never seen any specimens from these islands in the large museum herbaria I have from time to time examined. Dr. Riddle writes me, however, that he has noted Nantucket material in various herbaria. It was nevertheless on account of its scarcity that I ventured to ask Mr. Bicknell to gather what specimens he could for me,— and to him I am gratefully indebted.

The lichen flora as exhibited by this collection shows an interesting mixture of littoral and Austral species whose presence it is not difficult to explain by the climatic conditions governing the islands. A few curious northern species are noted.

The plants listed here are now to be found in the author's herbarium; duplicates of a few were sent to Dr. L. W. Riddle and Dr. Ludwig Scriba for their collaborative opinions.

Family: *Usneaceae*. **Group**: *Radiatae* Hue.

Usnea florida (L.) Web., on *Pinus rigida* and oak-post, O'Connell farm, June 4–11; on cockspur thorn, Thornlot, June 4.

Letharia thamnodes (Flot.) Hue, on *Pinus rigida*, O'Connell farm, June 4.

Ramalina rigida (Pers.) Ach., on cockspur thorn, Thornlot, June 4; on *Pinus rigida*, O'Connell farm, June 4.

Ramalina dilacerata (Hoffm.) Wain., on twigs, O'Connell farm, June 4.

Teloschistes chrysophthalmus (L.) Norm., on cockspur thorn, Thornlot, June 4. This plant was also found in the Wheelock herbarium from Nantucket.

Family: *Cladoniaceae*. **Group**: *Stratosi-radiatae* Hue.

Cladonia rangiferina (L.) Web., in swamp, and on edge of bog, Polpis, June 15.

Cladonia sylvatica (L.) Rabenh., on open commons, Madequet, June 17.

Cladonia furcata var. *racemosa* Wain., on ground, Miacomet, June 11, and in swamp, Polpis, June 15.

Cladonia reticulata (Russ.) Wain., on sandy plain, Madequet, June 17; on dry bank, Reed pond, June 16; on edge of bog, Polpis, June 15; on open downs, Hummock pond, June 11; on dry commons, Madequet, June 17.

Cladonia verticellata (Hoffm.) Flke., in sandy swamp, Polpis, June 15.

Cladonia fimbriata f. *simplex* (Weis.) Flot., in swamp on soil, Polpis, June 15.

Family: *Parmeliaceae*. **Group**: *Stratosae* Hue.

Parmelia perlata (L.) Ach., on *Quercus tinctoria*, Tuckernuck, June 17.

Parmelia perforata var. *hypotropa* Nyl., on twigs, June 7; on oak-post and on *Pinus rigida*, O'Connell farm, June 4–11. Tuckerman did not record this variety from north of South Carolina on the Atlantic coast, though Dr. Riddle writes me he has seen it from Nantucket before. I have never collected it in Rhode Island where the typical species is common.

Parmelia Borreri var. *rudecta* Tuck., on cockspur thorn, Thornlot, June 4.

Parmelia caperata (L.) Ach., as above.

Physcia parietina (L.) De Not., on rocks and trees, Coffin homestead, June 7. Represented in my herbarium (No. 1651) from Nantucket, collected by W. H. Trumbull, Jr.

Physcia hispida (Schreb, Fr.) Tuck., on rock, Coffin homestead, June 7.

Physcia tribacea (Ach.) Tuck., on rock, Coffin homestead, June 7.

Sticta pulmonaria (L.) Ach., on *Quercus tinctoria*, Tuckernuck, June 17. An interesting station for this rather northern lichen, as it is for *Parmelia perlata* recorded above.

FURTHER NOTES ON THE FLORA OF DUXBURY, MASSACHUSETTS.

John B. May, M. D.

The article in Rhodora for January by Mr. Knowlton interested me greatly, following my residence of several years in the old South Shore town, and I trust that a few additional notes will not come amiss. I must confess, however, that I write, not as a botanist, but merely as an observer and lover of Nature.

There is an interesting story connected with the naturalization of the English oak, *Quercus Robur*, mentioned by Mr. Knowlton. A century ago Duxbury was a famous port, the birthplace of fast clipper ships which sailed all the Seven Seas. One of the old master shipbuilders, noting the rapid disappearance of native timber used in his trade, started the conservation movement in Duxbury by planting groves of chestnut and English oak, bringing the latter from England in his own ships. Whether any of his seedlings survive today is doubtful, for none of the trees I have seen appear over fifty years old, but some of them lived long enough to start a flourishing second generation.

Another Pilgrim to Duxbury, from the West this time, is the Umbrella-weed, *Oxybaphus nyctageneus*, which I found in 1907 as a few plants growing by the roadside, and which in 1911 flourished around barn-yards and ash-heaps, showing a marked increase and wide distribution. *Melilotus alba* also seemed to walk right along the edges of the roads, while a small field near the centre of the town has been usurped by Grim the Collier, *Hieracium aurantiacum,* where its tawny flowers make a brave showing annually.

From this prosperous foreign invasion, one turns with sorrow to our two largest broad-leaved evergreens, *Ilex opaca* and *Kalmia latifolia,* doomed I fear to early extinction. Mountain laurel is found in a large swamp near Island Creek and there it flourished unmolested until recently, when the ubiquitous cranberry-grower began grubbing it out to make a "bog." The Holly is found in another swamp nearby, but every year at Christmas the few fruiting trees are stripped so ruthlessly that the outlook for seedlings is very poor. Here, too, the "bogger" is at work.

Pleurisy-root, *Asclepias tuberosa,* I noted as a single plant growing near the road from Tinkertown, while near Tarkiln is a colony of *Lupinus perennis.* The Partridge Pea, *Cassia Chamaecrista,* grows freely in a barren field near the shore and in this field within a few rods of salt water I found the Little Ladies' Tresses, *Spiranthes simplex,* growing with *S. gracilis* and *S. cernua.*

In conclusion, I would merely mention the fact that in a two hours walk this Fall I collected over seventy varieties of fungi, many of them edible.

WABAN, MASSACHUSETTS.

A NEW VARIETY OF LESPEDEZA CAPITATA.— A *Lespedeza* closely related to *L. capitata* Michx. but with the leaflets linear-oblong to lanceolate and acuminate has puzzled some of the Connecticut botanists who, judging by the leaflets, have been inclined to call the plant *L. angustifolia* (Pursh) Ell., but a close examination of material of the Connecticut plant from Norwich and Glastonbury shows it to have the short peduncles and long calyx of *L. capitata.* An apparently identical sheet in the Gray Herbarium, collected by F. E. McDonald at Peoria, Illinois, has been referred to *L. capitata,* var. *longifolia* (DC.) T. &. G., but like the Connecticut material it has the stem and the calyx loosely pilose and the leaflets covered beneath with dull pubescence. It is thus not satisfactorily referable to *L. capitata,* var. *longifolia* which, as originally described (as *L. longifolia* DC.), has the leaflets appressed silvery-silky beneath. Material from Beardstown, Illinois, with the narrow leaflets silvery-silky beneath appears to be good var. *longifolia* and this material has the pubescence of the calyx also appressed and silvery, while the short pubescence of the stem is subappressed. We have been unable to find any description of the extreme of *L. capitata* with narrow acuminate leaflets and dull spreading pubescence and here propose it as

Lespedeza capitata Michx., var. **stenophylla**, n. var., caulibus superne pilosis vel glabratis; foliolis lineari-oblongis vel anguste lanceolatis acuminatis, superne glabris subtus strigosis, pilis opacis; calycibus pilosis, pilis patentis opacis.— Type: open dry ground, Peoria, Illinois, September, 1904, *F. E. McDonald* in Gray Herb. Connecticut: sand bank near Trading Cove Bridge, Norwich, September 15, 1904, *C. B. Graves*; sandy ground along Connecticut River, Glastonbury, September 17, 1911, *C. H. Bissell*.— C. H. Bissell and M. L. Fernald.

FESTUCA OVINA L., VAR. DURIUSCULA (L.) KOCH IN SHELBURNE, NEW HAMPSHIRE.

Walter Deane.

In July, 1909, I visited my friends, Mr. and Mrs. G. N. McMillan on their estate in the Androscoggin valley, Shelburne, in northern New Hampshire, some 700 or 800 feet above sea level. During my visit I examined the grasses that form the turf of the large field adjoining the house. The location is on high land above the river and the grass is cut for hay. Besides the ordinary species, such as *Phleum pratense* L., *Agrostis alba* L., var. *vulgaris* (With.) Thurb., *Danthonia spicata* (L.) Beauv., *Dactylis glomerata* L., *Agropyron repens* (L.) Beauv. and the like, there were three Festucas. Two of these were *Festuca rubra* L. and *Festuca ovina* L., the solitary or few culms of the former distinguishing it from the tufted culms of the latter.

The third Festuca, however, was the most interesting of all, for it proved to be the European *Festuca ovina* L., var. *duriuscula* L. (Koch), credited in Gray's Manual, 7th edition, only as sparingly introduced in Wisconsin and Iowa. It occurred in great abundance over the field in dense tufted mats, covering areas varying from one to ten or more feet across, and the dull reddish color of the spikes on their gracefully nodding culms, especially in a strong breeze, made a picture more attractive to the botanist than to the agriculturist, for the presence of the plant indicates a barren soil. This grass, as well as the other Festucas, was submitted to Prof. A. S. Hitchcock and Mrs. Agnes Chase of the Department of Agriculture, Washington, D. C. They have given them careful examination and have most kindly communicated to me the following notes on the variety.

Under date of October 19, 1911, Mrs. Chase writes; "The Festuca specimens I have examined and compared with our United States and European material. They fall within the duriuscula circle better than anywhere else. The whole ovina group is a complex, intergrading inextricably. Your plants agree with some determined by Hackel as *F. ovina duriuscula*, except that the leaves of yours are more conspicuously clustered at the base. The European *F. ovina* v. *glauca* (Lam.) Hack. is like yours in habit, but in your specimens of it the panicles as well as foliage are glaucous. This, like *duriuscula*, has glabrous lemmas. The var. *glauca* is not known to grow in America." Prof. Hitchcock writes on February 15, 1912; "I have looked over the specimen of Festuca you sent down and I think it is correctly named (*Festuca ovina* var. *duriuscula*). I have compared it with European specimens and have looked up the descriptions in Hackel's monograph of the European species of Festuca and also Ascherson and Graebner's Synopsis of Middle European plants. Your plant is the subvariety *trachyphylla* Hack. which differs from the typical form of *duriuscula* in having scabrous blades."

Before the development of the farm, about twenty years ago, by Mr. Charles Endicott, the former owner, the area where this variety grows was a typical stone field, thickly covered with stones and boulders of various sizes more or less imbedded in the ground. Many such fields are to-day scattered over northern New England. The obstructions were removed and, after grading was done, a foreign clover was first planted, and this may possibly account for the introduction of the *Festuca ovina* L., var. *duriuscula* (L.) Koch, for it has certainly been established there for a number of years. It is in the more sterile portions of the field, left by the removal of the larger rocks, that this grass flourishes, maturing by the end of June, and it is in similar situations in the same field that *Euphorbia Cyparissias* L. fruits so abundantly, as was recorded in Rhodora, xii. 57–61 (1910).

There is no reason why this European grass should not be found elsewhere in New England in suitable localities, and doubtless, now that attention has been called to it, this will prove true. This Festuca is in my herbarium, while specimens have been deposited in the Gray Herbarium, the Herbarium of the New England Botanical Club, and the Herbarium of the United States Department of Agriculture at Washington, D. C.

Cambridge, Massachusetts.

A Flora of the New Jersey Pine Barrens.—Mr. Witmer Stone's[1] flora of southern New Jersey is one of the notable local floras of recent years. In the author's own words, "it places on record the present condition and history of one of the most interesting botanical areas in the United States,— the Pine Barrens of New Jersey." The introductory chapter is a detailed statistical study of the entire indigenous flora of southern New Jersey. It presents a division of the species into four groups; (1) the species of wide range north and south of New Jersey, (2) northern species which reach their southern limit in or near southern New Jersey, (3) coastal plain species which reach their northern limits between southern New Jersey and the northeastern extension of the coastal plain in Massachusetts, and (4) species of local distribution in or near southern New Jersey. A further analysis shows the composition of the flora of each of the five distinct floral districts; (1) The West Jersey, or middle district (covering the Delaware Valley region south of Trenton, and also the country below the fall line and north of the Pine Barrens), (2) the Pine Barrens, (3) the coastal strip, (4) the Cape May district, and (5) the maritime district. The floral analysis is similar to that in Prof. Fernald's recent discussion of the origin of the Newfoundland flora (v. Rhodora XIII, p. 135 et seq. 1911) and is likewise accompanied by maps illustrating the several types of distribution.

The author concludes that in the New Jersey Pine Barrens we have some of the sand and bog elements of a formerly wide-spread *austral* flora which has been largely "superseded" over most of the coastal plain by more "advanced" elements of similar origin. Mr. Stone weakens his own conclusion by classing many plants with floras to which they certainly do not belong. Thus, the typical pine-barren *Schizaea pusilla* and *Corema Conradii* are considered by Mr. Stone as boreal species which have been driven south, whereas there seems to be no escape from Fernald's conclusion that they are of austral origin. In listing the southern elements in the pine barren flora, Mr. Stone fails to distinguish between species which in the south are coastal only

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[1] Stone, Witmer: The plants of southern New Jersey, with especial reference to the Flora of the Pine Barrens and the geographic distribution of the Species. Ann. Report N. J. State Mus. 1910. Part II, pp. 21–828, ff. 1–5, CXXIX plates + map. (Trenton, 1912.)

(e. g. *Lycopodium carolinianum*) and others which are high Alleghanian (e.g. *Leiophyllum buxifolium*). On the other hand *Rhododendron maximum*, an Alleghanian type, is listed as boreal, which it certainly is not! The detailed statements of species distribution in the author's own area, however, leave little to be desired. The data are based upon many years of active field work by Mr. Stone and his associates, Messrs. Bayard Long and S. S. Van Pelt, and on the critical study of more than 33,000 herbarium specimens. It appears from the frequent acknowledgment of his aid that Mr. Long also had a considerable share in the determinative work.

As in several late local floras, the systematic catalogue of the species is interpolated with keys to the families, genera, and species. The keys include introduced weeds, which, however, are not further mentioned except in brief foot-notes. The native plants are not described, but there are free notes on distribution, characters, local history, etc., which transform what would otherwise be a bare catalogue into an account which can be read for pleasure. The notes on Schizaea and Corema may be mentioned as among the more interesting ones.

It is not always clear why the author disposes as he does of some of the minor variations of species. For example, nothing would have thrown more light on the geographic affinities of the pine barren flora than the recognition of *Juncus effusus* var. *conglomeratus*, and further notes on its distribution. Again, should we not be told why the author fails to recognize the coastal plain beech as distinct from the Alleghanian form? In Maryland and Virginia, the varieties of Peltandra proposed by Mr. Tidestrom (RHODORA XIII, p. 47, 1910) are very distinct, although known from few stations. If Mr. Stone has found them frequently enough to feel confident in regarding them as individual variations, a more detailed discussion of them would be welcome. Other cases might be mentioned in which decisions between conflicting views regarding the taxonomic status of forms seem to have been made arbitrarily. This fault, however, is more than overbalanced by the care with which the record of every species admitted to the flora has been put on a firm basis. The author has spared no pains in searching out old indefinite records, which he has either substantiated or discredited. Another feature of the book which deserves high commendation is the accurate statement, for each species, of the date of flowering, ripening of the fruit, or maturation of the spores, as the case required. These data were supplied by Mr. Bayard Long, who also contributed an account of the methods and objects of his investigation (p. 115).

Mr. Stone's ideas on nomenclature, to the reviewer at least, are thoroughly objectionable. He believes, for example, that botanists should follow that zoological usage which permits old varietal names to displace later specific names. Happily, most botanists have not been "playing the game" of nomenclature so long that it has been impossible to reconvert the erring ones to sound doctrine (on this point at least) before the "game" became too much an object in itself to be renounced. Even at the risk of seeming to lay undue emphasis upon points which in a local flora are comparatively unimportant, attention should be called to certain nomenclatorial practices which are either distinctly retrogressive or else totally at variance with the botanical traditions which should guide botanical authors. A distinctly retrogressive tendency is shown in the continued use of "duplicate monomials"; the method of author citation is an instance of useless and uncalled for violation of botanical tradition. Only one author (the one who first used the specific or "subspecific" adjective) is cited,— in parenthesis if the name has been modified by later authors, but otherwise not. One need not look beyond the pages of the New Jersey flora to see how this method lends itself to error, for in the cases of seventeen out of the sixty "subspecific" names which Mr. Stone uses, he has misapplied the parentheses. If zoologists commonly ascribe a quarter of the names they mention to authors who never published them, it is sincerely to be hoped that botanists will not follow zoological precedent.

A practice which cannot be too strongly condemned is that of making new combinations without in any way indicating them as new. (See Bot. Gaz. xliv, p. 304, 1907.) This Mr. Stone appears to have done in eleven cases among the sixty "subspecific" names in his book. There are also new combinations among the specific names. For example, *Panicum commonsianum addisonii* "Nash," *Carex leptalea harperi* "Fernald," *Rubus villosus enslenii* "Tratt.," *Euthamia graminifolia nuttallii* (Greene), *B[lephariglottis] canbyi* "Ames," and *Gyrostachys beckii* (Lindley) are all new combinations, but not indicated as such; those with the authority in quotation marks are moreover "falsely branded"; finally, all illustrate the abominable habit which zoologists have of decapitalizing personal names.

Except for nomenclatorial innovations "The Plants of Southern New Jersey" is a remarkably pleasing work. It has numerous carefully executed illustrations,— line-drawings, photographs of paintings by H. E. Stone, and photographs from nature. Some of them, especially the photographs of grasses and sedges, it would be hard to excel. It is safe to predict that none of the local floras now current will be longer held in esteem by botanists generally than this one of Mr. Stone's. To special students of the coastal plain vegetation it will of course be indispensable. Such a work reflects great credit not only upon its author but also upon the state which publishes it and upon those members of the Philadelphia Botanical Club whose enthusiastic cooperation made it possible.— H. H. Bartlett, Bethesda, Maryland.

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